

WHAT IS CLAIMED IS:

- 1 1. A multimedia browser, comprising:
2 a delivery media integration framework and flexible demultiplexing layer;
3 an access layer connected to the delivery media integration framework and
4 flexible demultiplexing layer;
5 an MPEG-4 media decoder structure connected to the access layer and
6 having at least one media decoder ;
7 a binary format of scene decoder connected to the access layer and the
8 MPEG-4 media decoder structure;
9 compositor connected to the MPEG-4 media decoder structure; and
10 a display process.

- 1 2. The multimedia browser of claim 1, wherein the MPEG-4 media decoder
2 structure comprises at least one of:
3 a video object decoder;
4 a facial/object animation object decoder;
5 an image texture object decoder;
6 an audio object decoder; and
7 a structured audio object decoder.

- 1 3. The multimedia browser of claim 1, wherein the binary format of scene
2 decoder is further connected to the compositor.

- 1 4. The multimedia browser of claim 1, wherein at least one control signal
2 from at least one user input device is provided to the compositor.

- 1 5. The multimedia browser of claim 1, wherein:
2 the delivery media integration framework and flexible demultiplexing
3 layer receives MPEG-4 coded content, the MPEG-4 coded content including at least one
4 of audio media, visual media and synthetic media; and

5 the delivery media integration framework and flexible demultiplexing
6 layer outputs to the access layer at least one flexmux protocol data unit extracted from the
7 MPEG-4 coded content.

1 6. The multimedia browser of claim 5, wherein the access layer outputs at
2 least one unformatted access layer protocol data unit extracted from the at least one
3 flexmux protocol data unit.

1 7. The multimedia browser of claim 6, wherein unformatted access layer
2 protocol data units extracted from the at least one flexmux protocol data unit that
3 correspond to coded video streams are output to a video object decoder of the MPEG-4
4 media decoder structure.

1 8. The multimedia browser of claim 6, wherein unformatted access layer
2 protocol data units extracted from the at least one flexmux protocol data unit that
3 correspond to coded facial and/or animation streams are output to a facial/object
4 animation object decoder of the MPEG-4 media decoder structure.

1 9. The multimedia browser of claim 6, wherein unformatted access layer
2 protocol data units extracted from the at least one flexmux protocol data unit that
3 correspond to coded audio streams are output to an audio object decoder of the MPEG-4
4 media decoder structure.

1 10. The multimedia browser of claim 6, wherein unformatted access layer
2 protocol data units extracted from the at least one flexmux protocol data unit that
3 correspond to coded speech streams are output to a structured audio object decoder of the
4 MPEG-4 media decoder structure.

1 11. The multimedia browser of claim 6, wherein unformatted access layer
2 protocol data units extracted from the at least one flexmux protocol data unit that

3 correspond to scene description representations are output to the binary format of scene
4 decoder.

1 12. The multimedia browser of claim 1, wherein the multimedia browser is
2 provided as a plug-in to a document browser.

1 13. The multimedia browser of claim 1, wherein the multimedia browser is at
2 least partially integrated with a document browser.

1 14. The multimedia browser of claim 13, wherein the multimedia browser is
2 fully integrated with the document browser.

1 15. The multimedia browser of claim 1, wherein the multimedia browser is
2 implemented as at least one native method.

1 16. The multimedia browser of claim 15, wherein the at least one native
2 method can be called by a Java method.

1 17. The multimedia browser of claim 15, wherein the at least one native
2 method can call a Java method.

1 18. A multimedia browser that inputs MPEG-4 data having a scene
2 description graph and data related to at least one object, comprising:
3 an audiovisual object demultiplexer and binary format of scene browser;
4 a binary format of scene (BIFS) scene description graph interpreter
5 connected to the audiovisual object demultiplexer and binary format of scene browser;
6 and
7 a media decoders, compositor and renderer connected to the BIFS scene
8 description graph interpreter and the audiovisual object demultiplexer and binary format
9 of scene browser.

1 19. The multimedia browser of claim 18, wherein at least one control signal
2 from at least one user input device is provided to the audiovisual object demultiplexer
3 and binary format of scene browser.

1 20. The multimedia browser of claim 18, wherein the MPEG-4 data having a
2 scene description graph and data related to at least one object comprises MPEG-4 coded
3 content, the MPEG-4 coded content including at least one of audio media, visual media
4 and synthetic media.

1 21. The multimedia browser of claim 18, wherein the binary format of scene
2 (BIFS) scene description graph interpreter invokes at least one media decoder based on
3 the scene description graph.

1 22. The multimedia browser of claim 18, wherein the binary format of scene
2 (BIFS) scene description graph interpreter comprises:
3 at least one object node; and
4 at least one corresponding object programmer interface, each object
5 programmer interface connected to a corresponding one of the at least one object node.

1 23. The multimedia browser of claim 22, wherein the media decoders,
2 compositor and renderer comprises:
3 at least one decoder, each decoder connected to a corresponding one the at
4 least one object programmer interface; and
5 a scene compositor connected to the at least one decoder.

1 24. The multimedia browser of claim 23, wherein the scene compositor is
2 connected to the audiovisual object demultiplexer and binary format of scene browser and
3 the audiovisual object demultiplexer and binary format of scene browser is connected to
4 the scene compositor .

1 25. The multimedia browser of claim 18, wherein the binary format of scene
2 (BIFS) scene description graph interpreter comprises:
3 a VideoObject2D node or a MovieTexture node connected to the
4 audiovisual object demultiplexer and binary format of scene browser;
5 a video object programmer interface connected to the VideoObject2D or
6 MovieTexture node;
7 an AudioSource node connected to the audiovisual object demultiplexer
8 and binary format of scene browser;
9 an audio object programmer interface connected to the AudioSource node;
10 an ImageTexture node connected to the audiovisual object demultiplexer
11 and binary format of scene browser; and
12 an image object programmer interface connected to the ImageTexture
13 node.

1 26. The multimedia browser of claim 25, wherein the media decoders,
2 compositor and renderer comprises:
3 a video object decoder connected to the video object programmer
4 interface;
5 an audio object decoder connected to the audio object programmer
6 interface;
7 an image object decoder connected to the image object programmer
8 interface; and
9 a scene compositor connected to each of the video object decoder, the
10 audio object decoder, and the image object decoder.

1 27. The multimedia browser of claim 26, wherein the scene compositor is
2 connected to the audiovisual object demultiplexer and binary format of scene browser and
3 the audiovisual object demultiplexer and binary format of scene browser is connected to
4 the scene compositor .

1 28. The multimedia browser of claim 25, wherein the binary format of scene
2 (BIFS) scene description graph interpreter further comprises:
3 a proto node; and
4 a native proto programmer interface connected to the proto node.

1 29. The multimedia browser of claim 28, wherein the media decoders,
2 compositor and renderer comprises:
3 a video object decoder connected to the video object programmer
4 interface;
5 an audio object decoder connected to the audio object programmer
6 interface;
7 an image object decoder connected to the image object programmer
8 interface;
9 a native proto implementation connected to the native proto programmer
10 interface; and
11 a scene compositor connected to each of the native proto implementation,
12 the video object decoder, the audio object decoder, and the image object decoder.

1 30. The multimedia browser of claim 29, wherein the scene compositor is
2 connected to the audiovisual object demultiplexer and binary format of scene browser and
3 the audiovisual object demultiplexer and binary format of scene browser is connected to
4 the scene compositor .

1 31. The multimedia browser of claim 25, wherein the binary format of scene
2 (BIFS) scene description graph interpreter further comprises:
3 a script node;
4 an interpreter programmer interface connected to the script node; and
5 a scripting interface.

1 32. The multimedia browser of claim 31, wherein the media decoders;
2 compositor and renderer comprises:

3 a video object decoder connected to the video object programmer
4 interface;
5 an audio object decoder connected to the audio object programmer
6 interface;
7 an image object decoder connected to the image object programmer
8 interface;
9 a native proto implementation connected to the native proto programmer
10 interface;
11 a JavaScript interpreter connected to the interpreter programmer interface;
12 a Java interpreter connected to the interpreter programmer interface; and
13 a scene compositor connected to each of the scripting interface, the native
14 proto implementation, the video object decoder, the audio object decoder, and the image
15 object decoder.

1 33. The multimedia browser of claim 32, wherein the scene compositor is
2 connected to the audiovisual object demultiplexer and binary format of scene browser and
3 the audiovisual object demultiplexer and binary format of scene browser is connected to
4 the scene compositor.

1 34. The multimedia browser of claim 32, wherein the JavaScript interpreter
2 and the Java interpreter are connected to the scripting interface.

1 35. The multimedia browser of claim 34, wherein the multimedia browser
2 supports programmatic behavior and interaction via the JavaScript interpreter and the
3 Java interpreter to modify the scene internally.

1 36. The multimedia browser of claim 31, wherein the scripting interface is
2 connected to the audiovisual object demultiplexer and binary format of scene browser.

1 37. The multimedia browser of claim 18, wherein at least one control signal
2 from at least one user input device is provided to the audiovisual object demultiplexer

3 and binary format of scene browser and to the binary format of scene (BIFS) scene
4 description graph interpreter.

1 38. The multimedia browser of claim 18, further comprising an adaptive audio
2 visual session connected to the audiovisual object demultiplexer and binary format of
3 scene browser.

1 39. The multimedia browser of claim 38, wherein at least one control signal
2 from at least one user input device is provided to the adaptive audio visual session.

1 40. The multimedia browser of claim 38, wherein the adaptive audio visual
2 session comprises:
3 an adaptive audio visual session external interface;
4 a browser specific binding connected to the adaptive audio visual session
5 external interface; and
6 a browser programmer interface connected to the browser specific binding.

1 41. The multimedia browser of claim 40, wherein the audiovisual object
2 demultiplexer and binary format of scene browser is connected to the browser
3 programmer interface.

1 42. The multimedia browser of claim 40, wherein at least one control signal is
2 provided to the adaptive audio visual session external interface.

1 43. The multimedia browser of claim 42, wherein the at least one control
2 signal is an adaptive audio visual session external script or applet.

1 44. The multimedia browser of claim 18, wherein the multimedia browser
2 supports programmatic behavior and interaction via at least one of Java and JavaScript to
3 modify the scene internally.

- 1 45. The multimedia browser of claim 18, wherein the multimedia browser
 - 2 supports external interface for BIFS player control in response to changing resources and
 - 3 support of user interaction
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